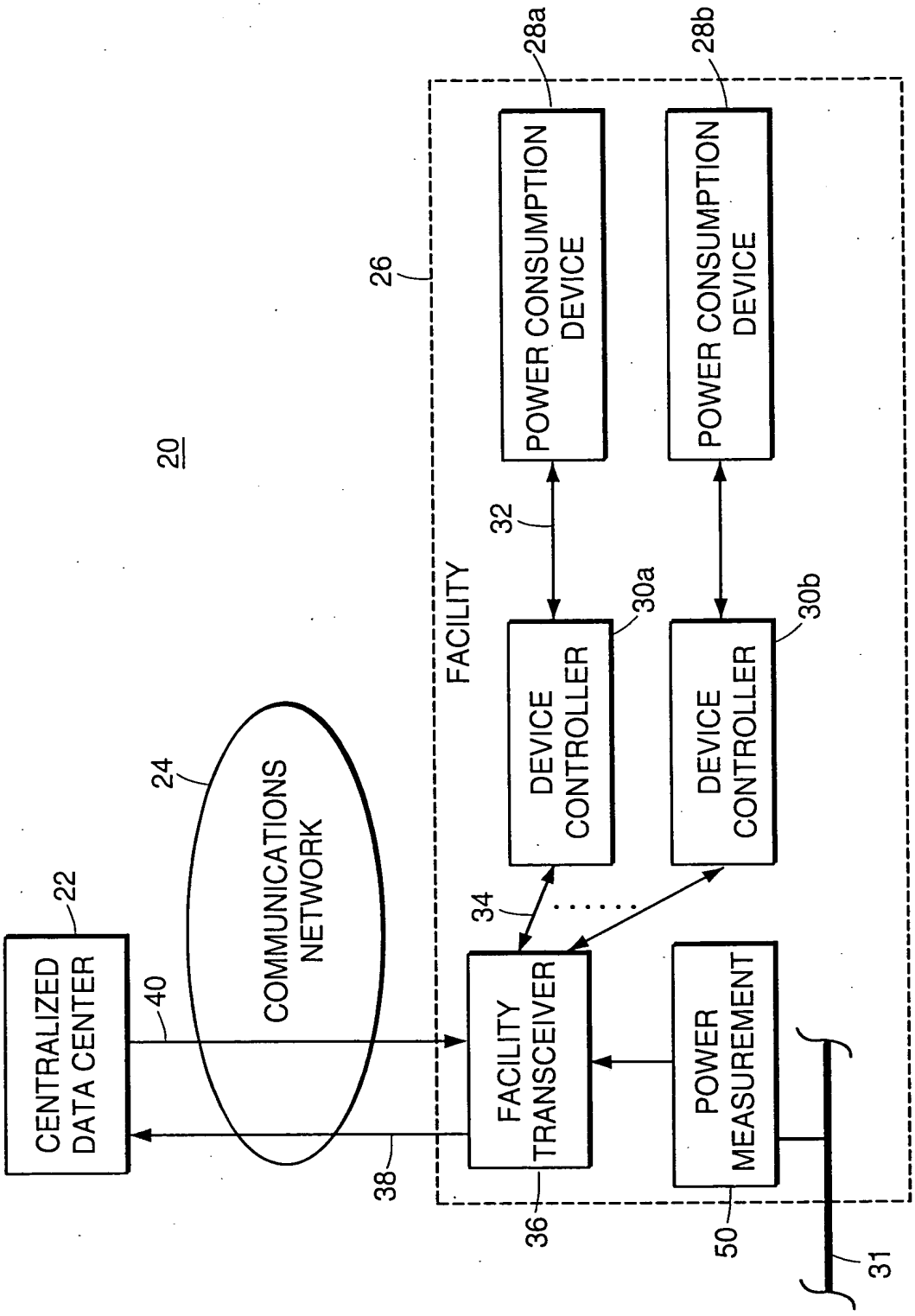

20
22
CENTRALIZED DATA CENTER
24
COMMUNICATIONS NETWORK
26
FACILITY
28a
POWER CONSUMPTION DEVICE
28b
POWER CONSUMPTION DEVICE
30a
DEVICE CONTROLLER
30b
DEVICE CONTROLLER
32
34
36
FACILITY TRANSCEIVER
38
40
50
POWER MEASUREMENT
31

FIG. 1

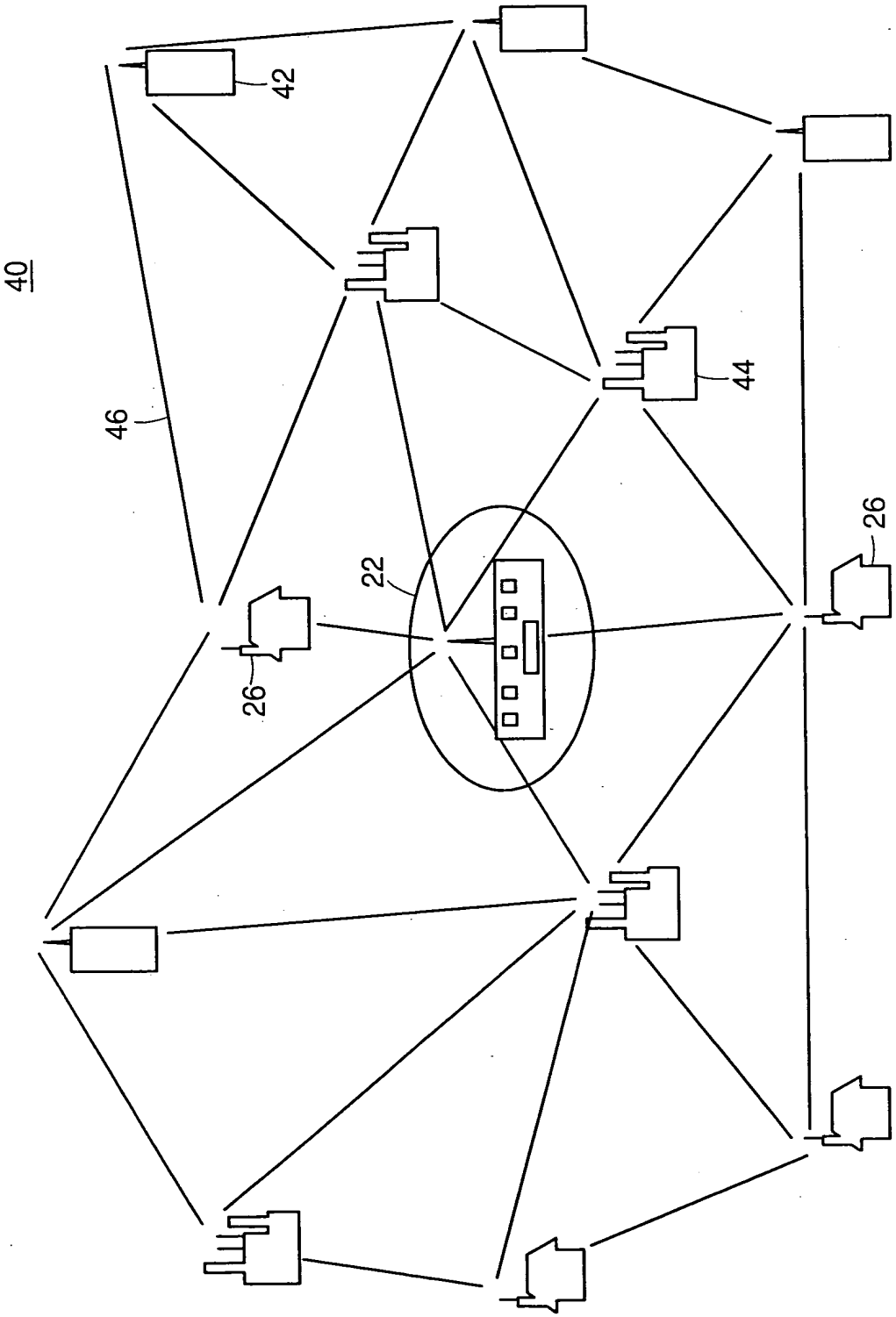


FIG. 2

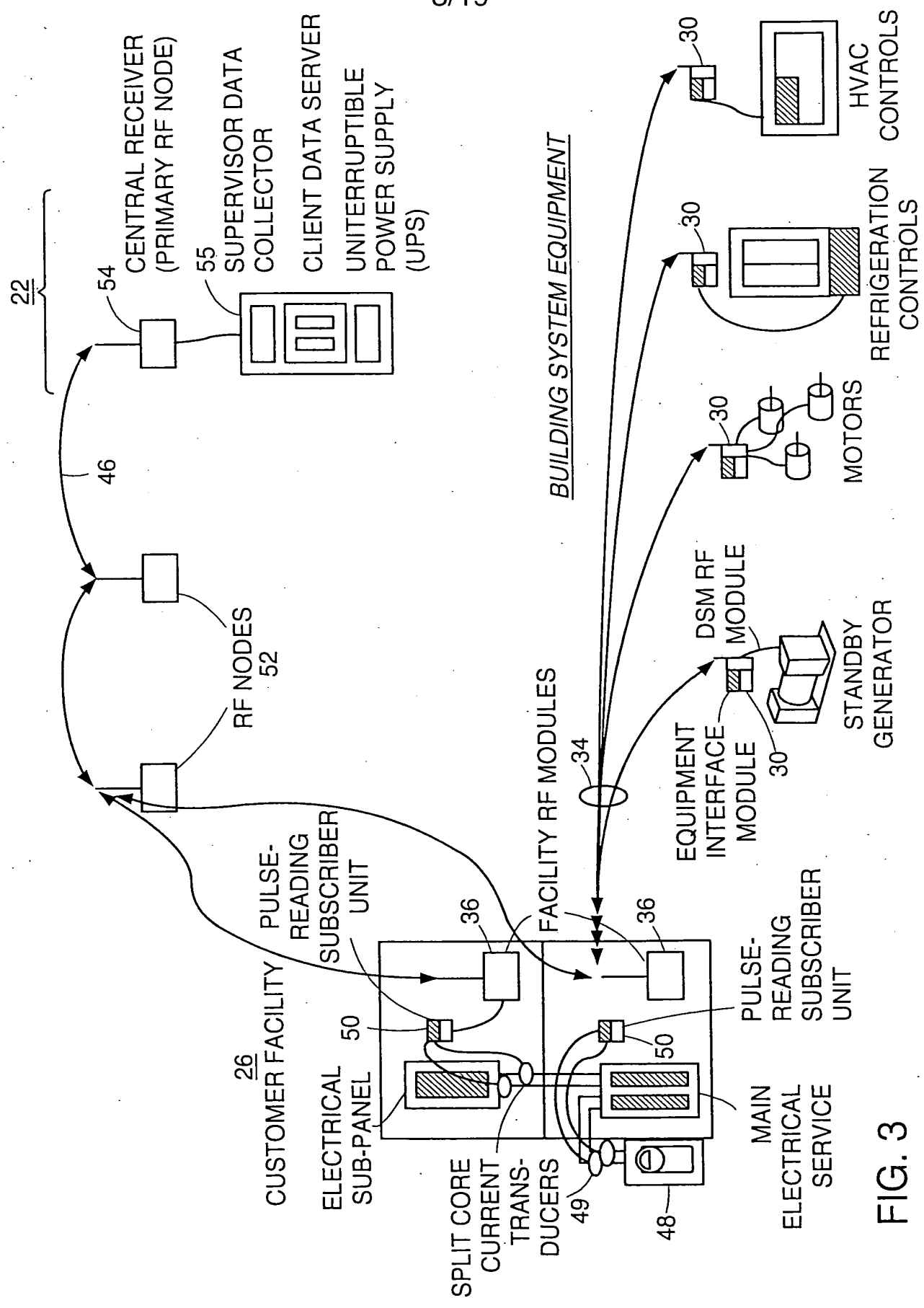

22
54
CENTRAL RECEIVER (PRIMARY RF NODE)
55
SUPERVISOR DATA COLLECTOR
CLIENT DATA SERVER
UNINTERRUPTIBLE POWER SUPPLY (UPS)
46
RF NODES 52
BUILDING SYSTEM EQUIPMENT
30
HVAC CONTROLS
REFRIGERATION CONTROLS
MOTORS
DSM RF MODULE
STANDBY GENERATOR
EQUIPMENT INTERFACE MODULE
34
FACILITY RF MODULES
PULSE-READING SUBSCRIBER UNIT
36
26
CUSTOMER FACILITY
ELECTRICAL SUB-PANEL
50
SPLIT CORE CURRENT TRANS-DUCERS
49
48
MAIN ELECTRICAL SERVICE

FIG. 3

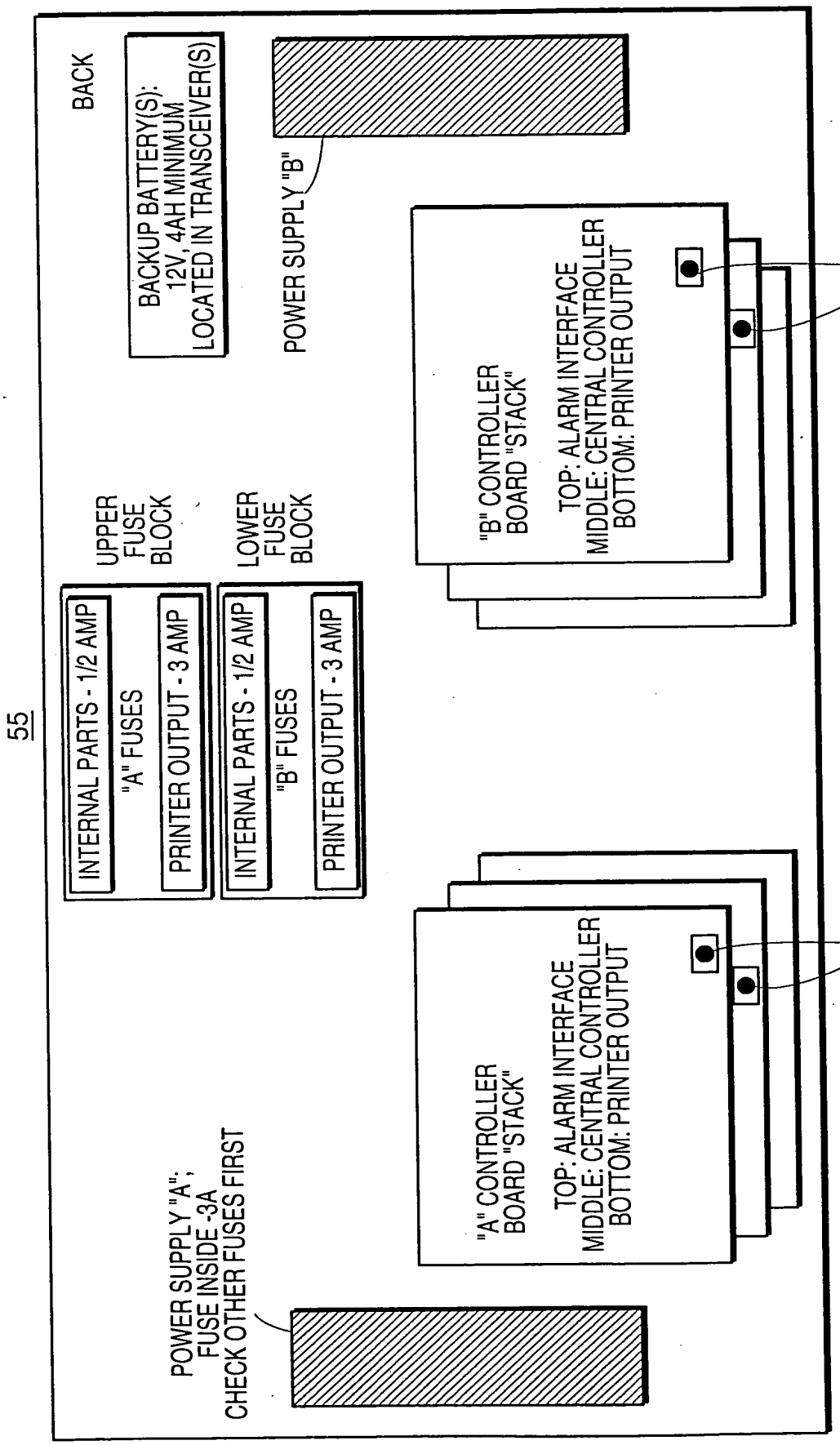

55
BACK
BACKUP BATTERY(S):
12V, 4AH MINIMUM
LOCATED IN TRANSCEIVER(S)
POWER SUPPLY "B"
"B" CONTROLLER
BOARD "STACK"
TOP: ALARM INTERFACE
MIDDLE: CENTRAL CONTROLLER
BOTTOM: PRINTER OUTPUT
RESET
SWITCHES
UPPER
FUSE
BLOCK
INTERNAL PARTS - 1/2 AMP
"A" FUSES
PRINTER OUTPUT - 3 AMP
LOWER
FUSE
BLOCK
INTERNAL PARTS - 1/2 AMP
"B" FUSES
PRINTER OUTPUT - 3 AMP
"A" CONTROLLER
BOARD "STACK"
TOP: ALARM INTERFACE
MIDDLE: CENTRAL CONTROLLER
BOTTOM: PRINTER OUTPUT
RESET
SWITCHES
POWER SUPPLY "A";
FUSE INSIDE -3A
CHECK OTHER FUSES FIRST

FIG. 4A

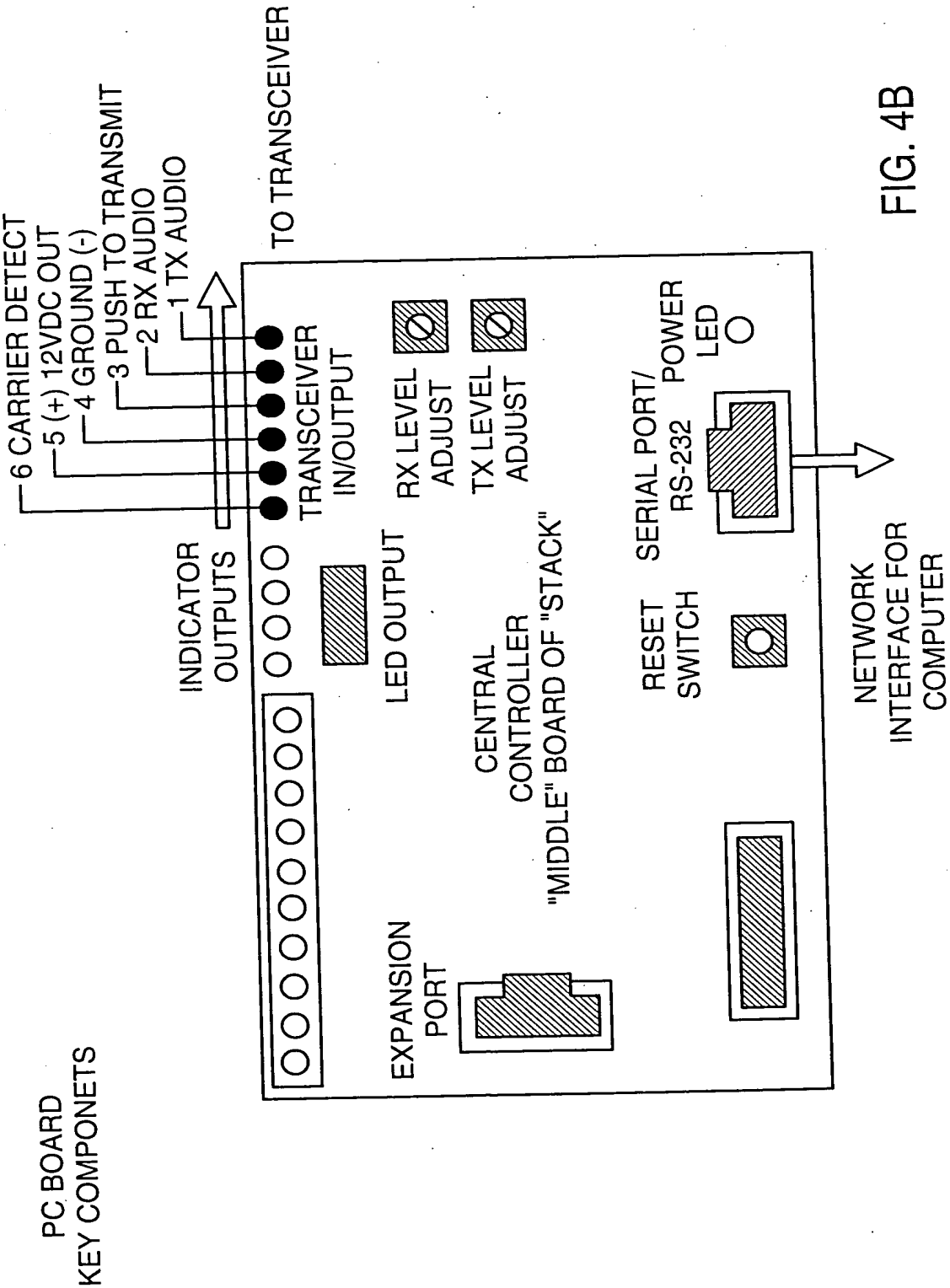

PC BOARD
KEY COMPONETS
6 CARRIER DETECT
5 (+) 12VDC OUT
4 GROUND (-)
3 PUSH TO TRANSMIT
2 RX AUDIO
1 TX AUDIO
TO TRANSCEIVER
INDICATOR OUTPUTS
TRANSCEIVER IN/OUTPUT
LED OUTPUT
RX LEVEL ADJUST
TX LEVEL ADJUST
CENTRAL CONTROLLER "MIDDLE" BOARD OF "STACK"
EXPANSION PORT
RESET SWITCH
SERIAL PORT/ RS-232
POWER LED
NETWORK INTERFACE FOR COMPUTER

FIG. 4B

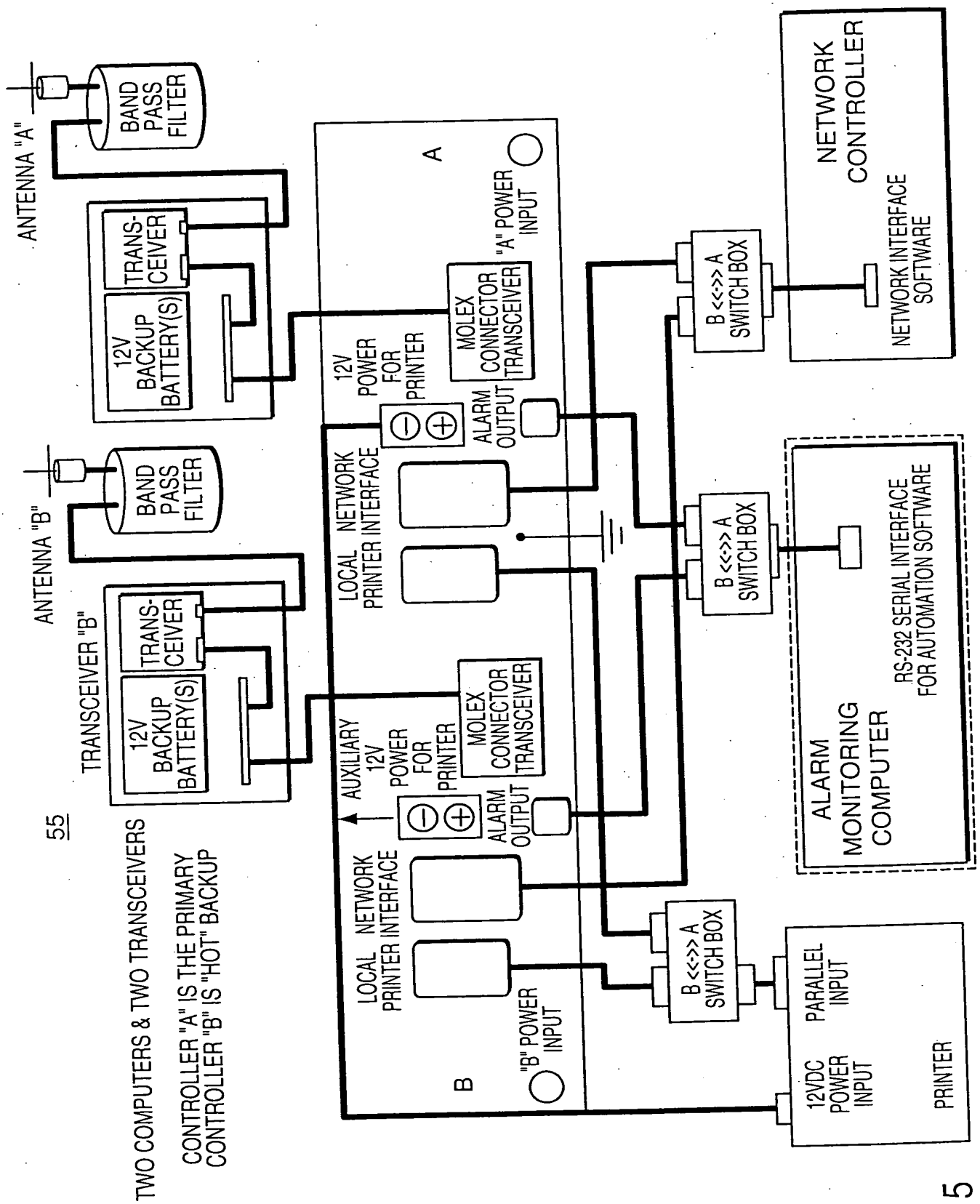

ANTENNA "A"
BAND PASS FILTER
TRANS-CEIVER
12V BACKUP BATTERY(S)
ANTENNA "B"
BAND PASS FILTER
TRANS-CEIVER
12V BACKUP BATTERY(S)
TRANSCEIVER "B"
55
TWO COMPUTERS & TWO TRANSCEIVERS
CONTROLLER "A" IS THE PRIMARY
CONTROLLER "B" IS "HOT" BACKUP
A
"A" POWER INPUT
MOLEX CONNECTOR TRANSCEIVER
12V POWER FOR PRINTER
ALARM OUTPUT
LOCAL NETWORK PRINTER INTERFACE
AUXILIARY 12V POWER FOR PRINTER
MOLEX CONNECTOR TRANSCEIVER
ALARM OUTPUT
LOCAL NETWORK PRINTER INTERFACE
B
"B" POWER INPUT
B <<->> A SWITCH BOX
B <<->> A SWITCH BOX
B <<->> A SWITCH BOX
NETWORK CONTROLLER
NETWORK INTERFACE SOFTWARE
ALARM MONITORING COMPUTER
RS-232 SERIAL INTERFACE FOR AUTOMATION SOFTWARE
12VDC POWER INPUT
PARALLEL INPUT
PRINTER

FIG. 5

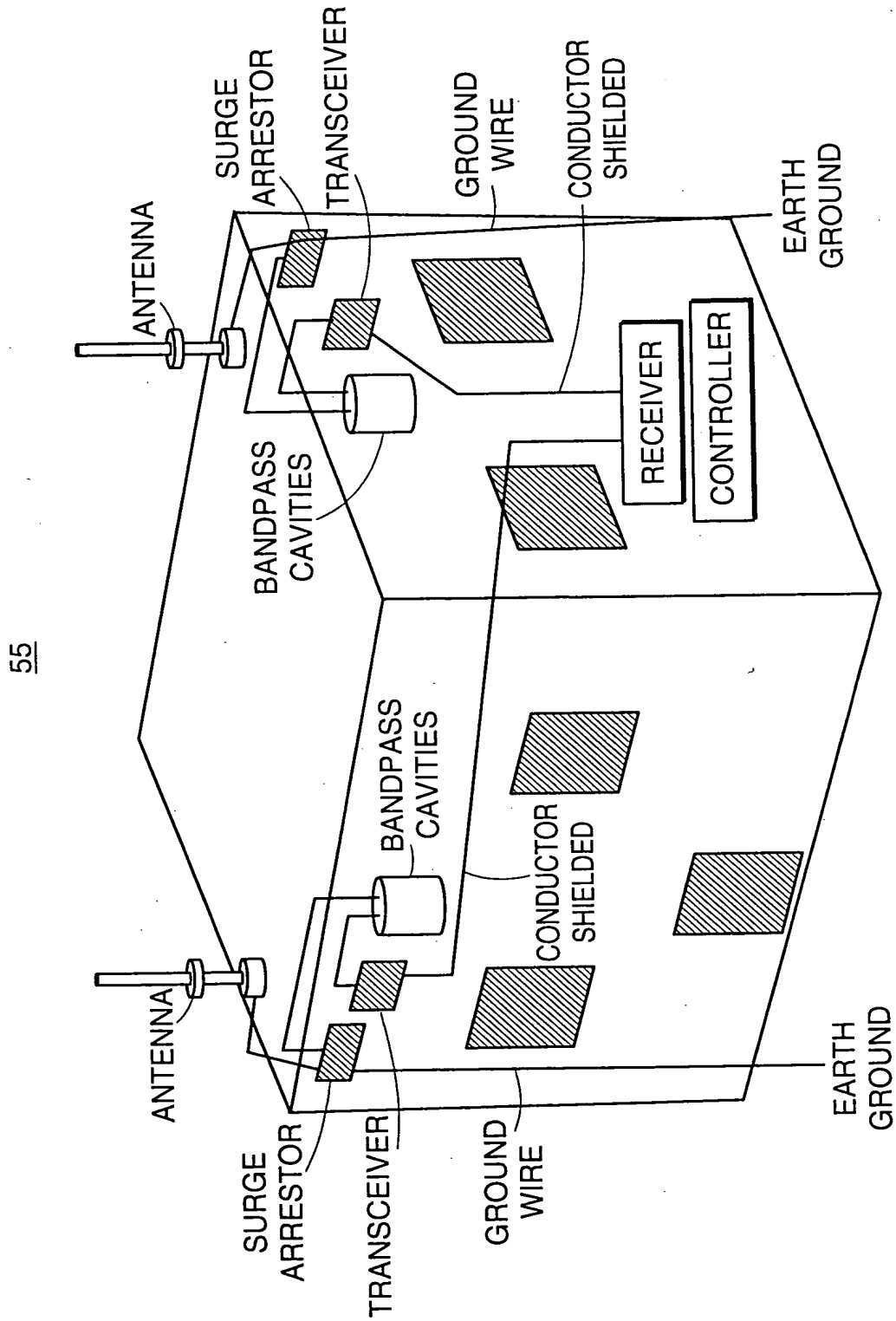

55
ANTENNA
SURGE ARRESTOR
TRANSCEIVER
GROUND WIRE
CONDUCTOR SHIELDED
EARTH GROUND
BANDPASS CAVITIES
RECEIVER
CONTROLLER
ANTENNA
BANDPASS CAVITIES
CONDUCTOR SHIELDED
SURGE ARRESTOR
TRANSCEIVER
GROUND WIRE
EARTH GROUND

FIG. 6

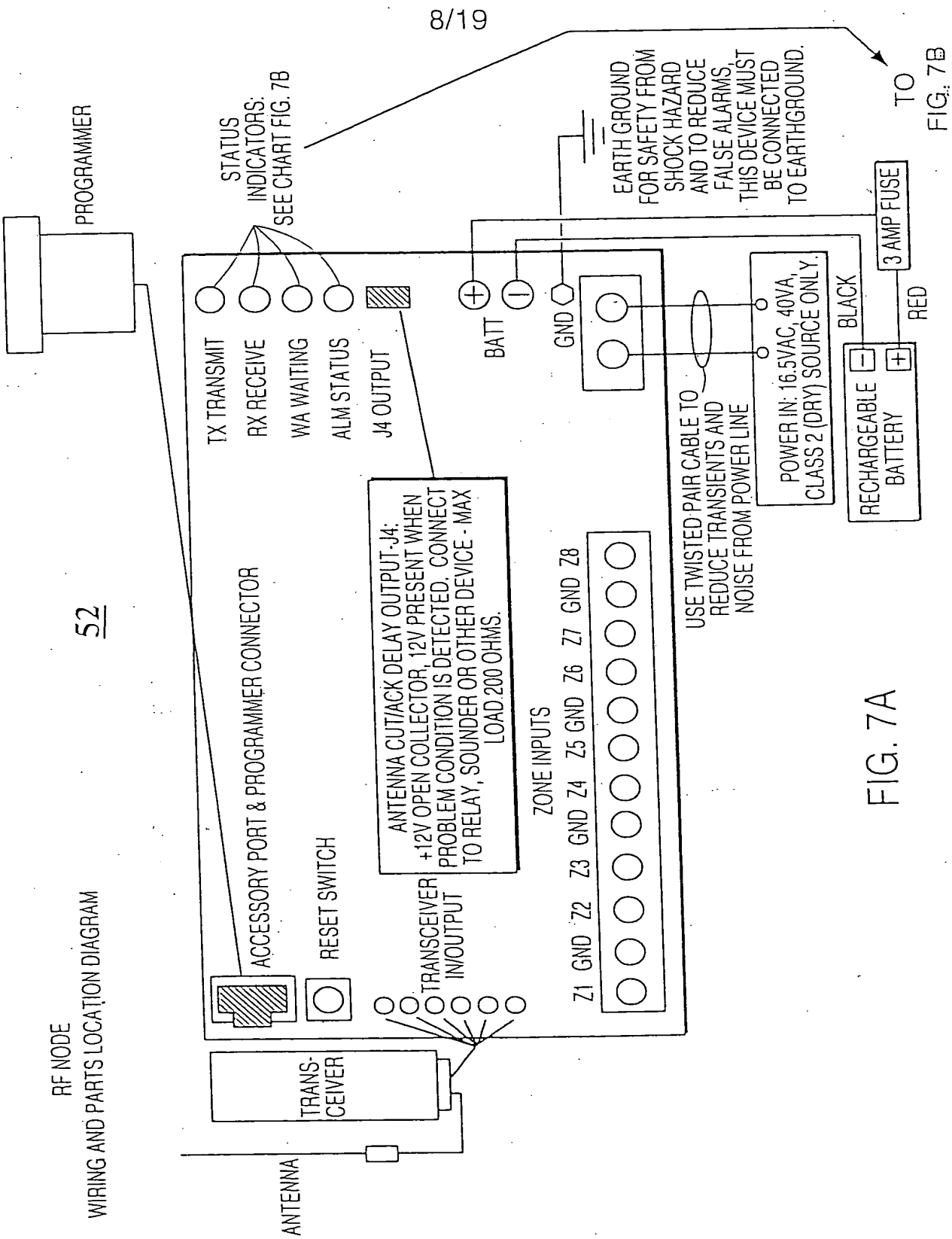
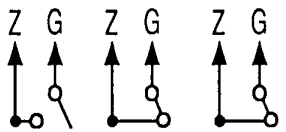

RF NODE
WIRING AND PARTS LOCATION DIAGRAM
52
PROGRAMMER
STATUS INDICATORS: SEE CHART FIG. 7B
TO FIG. 7B
EARTH GROUND FOR SAFETY FROM SHOCK HAZARD AND TO REDUCE FALSE ALARMS, THIS DEVICE MUST BE CONNECTED TO EARTHGROUND.
3 AMP FUSE
BLACK
RED
RECHARGEABLE BATTERY
POWER IN: 16.5VAC, 40VA, CLASS 2 (DRY) SOURCE ONLY.
USE TWISTED PAIR CABLE TO REDUCE TRANSIENTS AND NOISE FROM POWER LINE
BATT
GND
TX TRANSMIT
RX RECEIVE
WA WAITING
ALM STATUS
J4 OUTPUT
ANTENNA CUT/ACK DELAY OUTPUT-J4: +12V OPEN COLLECTOR, 12V PRESENT WHEN PROBLEM CONDITION IS DETECTED. CONNECT TO RELAY, SOUNDER OR OTHER DEVICE - MAX LOAD 200 OHMS.
ZONE INPUTS
Z1 GND Z2 Z3 GND Z4 Z5 GND Z6 Z7 GND Z8
ACCESSORY PORT & PROGRAMMER CONNECTOR
RESET SWITCH
TRANSCEIVER IN/OUTPUT
TRANS-CEIVER
ANTENNA

FIG. 7A

PROGRAMMABLE INPUT EXAMPLES:*
Z = ZONE, G = GROUND

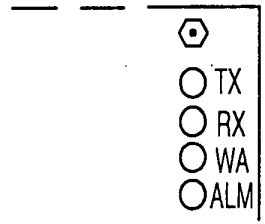


*INPUTS ARE INDIVIDUALLY PROGRAMMABLE FOR N.O., N.C., E.O.L AND VOLTAGE.
DEFAULT SETTING IS N.O. SEE MANUAL FOR PROGRAMMING AND DETAILED DIAGRAMS.
NOTE: ALL INPUT/OUPUT CONNECTIONS MUST BE PROTECTED AGAINST ANY CONDITION THAT WOULD INHIBIT THE OPERATION OF THIS DEVICE

FROM FIG. 7A

MODEL RF NODE
ELECTRICAL RATING: 12VDC, 175ma STANDBY, 800ma TRANSMIT
ONBOARD FUSE: SELF RESETTING / NOT USER SERVICEABLE
IN-LINE BATTERY FUSE: 3 AMPERE
RECHARGEABLE BATTERY REQ: 12V, 4 TO 7 AH
LOW BATTERY CONDITION IS REPORTED TO THE CENTRAL STATION.

STATUS INDICATORS:
LED'S ON UPPER RIGHT EDGE OF THE BOARD



RX - INDICATES RADIO RECEIVE (INCLUDES ANY RADIO OR ACTIVITY ON THIS FREQUENCY)
TX - INDICATES RADIO TRANSMIT
WA - STEADY ON = WAITING FOR ACKNOWLEDGEMENT OF LAST TRANSMISSION;
BLINKING = NOT ON NETWORK
OFF = NORMAL
AL - ALERT / TROUBLESHOOTING INDICATOR, "BLINK" CODES AS FOLLOWS:

-	-	-	STEADY BLINK - SYSTEM OK;
--	--	--	SHORT-SHORT BLINK - LOW BATTERY;
-—	-—	-—	SHORT-LONG BLINK - AN INPUT ZONE IS IN ALARM;
--—	--—	--—	SHORT-SHORT-LONG BLINK, LOW BATT & ZONE IN ALARM;
————			STEADY/NO BLINK - SELFTEST FAILURE (OTHER THAN LOW BATT)

FIG. 7B

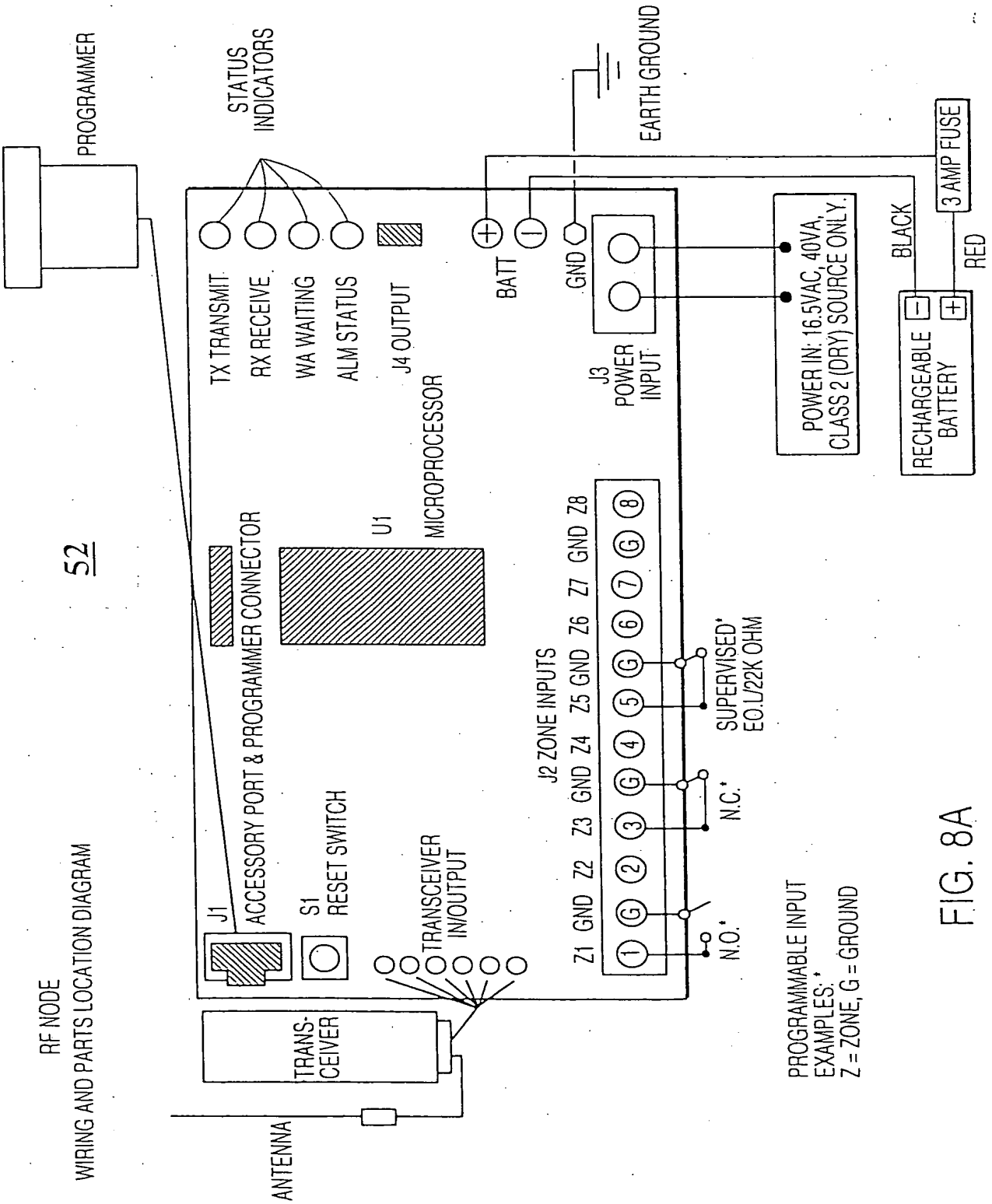

RF NODE
WIRING AND PARTS LOCATION DIAGRAM
52
PROGRAMMER
STATUS INDICATORS
EARTH GROUND
3 AMP FUSE
BLACK
RED
TX TRANSMIT
RX RECEIVE
WA WAITING
ALM STATUS
J4 OUTPUT
BATT
GND
J3 POWER INPUT
POWER IN: 16.5VAC, 40VA, CLASS 2 (DRY) SOURCE ONLY.
RECHARGEABLE BATTERY
U1 MICROPROCESSOR
ACCESSORY PORT & PROGRAMMER CONNECTOR
J1
S1 RESET SWITCH
TRANSCEIVER IN/OUTPUT
J2 ZONE INPUTS
Z1 GND Z2 Z3 GND Z4 Z5 GND Z6 Z7 GND Z8
SUPERVISED' EO.L/22K OHM
N.C.'
N.O.'
TRANS-CEIVER
ANTENNA
PROGRAMMABLE INPUT EXAMPLES:'
Z = ZONE, G = GROUND

FIG. 8A

*8 INPUTS ARE INDIVIDUALLY PROGRAMMABLE FOR N.O., N.C., E.O.L. AND VOLTAGE (4-30VOLTS).
DEFAULT SETTING IS E.O.L. SEE MANUAL FOR PROGRAMMING AND DETAILED DIAGRAMS.
NOTE: ALL INPUT/OUPUT CONNECTIONS MUST BE PROTECTED AGAINST ANY CONDITION THAT WOULD INHIBIT THE OPERATION OF THIS DEVICE.
*DEFAULT SETTING IS FOR SUPERVISED / E.O.L. ZONE INPUTS. RESISTORS MUST BE INSTALLED ON ALL ZONE INPUTS, EVEN WHEN NOT USED.

INPUT / OUTPUT CONNECTIONS
J1 PROGRAMMER / ACCESSORY PORT - CONNECTS TO PROGRAMMER.
J2 ZONE INPUTS TERMINAL BLOCK: GROUND (-): 8 ZONE INPUTS (DEFAULT = SUPERVISED END OF LINE RESISTOR (E.O.L)
J3 POWER INPUT TERMINAL BLOCK - 16.5 VAC
J4 ANTENNA CUT / ACKNOWLEDGEMENT DELAY OUTPUT - SHOULD THE UNIT NOT RECEIVE AN ACKNOWLEDGEMENT TO ANY MESSAGE FOR A TIME LONGER THAN THE PROGRAMMED PERIOD, THE OUTPUT GENERATES 12 VOLTS BETWEEN THE PINS TO SIGNAL A PROBLEM. CONNECT TO A RELAY, SOUNDER OR ALTERNATE COMMUNICATOR TO ANNUNCIATE THE PROBLEM (200 OHMS MAX LOAD).

CONTROLS
S1 RESET SWITCH - INITIALIZES CONTROLLER

UPGRADABLE INTEGRATED CIRCUIT
U1 MICROPROCESSOR, 40 PIN DIP; THIS CHIP IS MOUNTED IN A SOCKET, AND MAY BE REPLACED FOR UPGRADES OR SPECIAL APPLICATIONS.

FIG. 8B

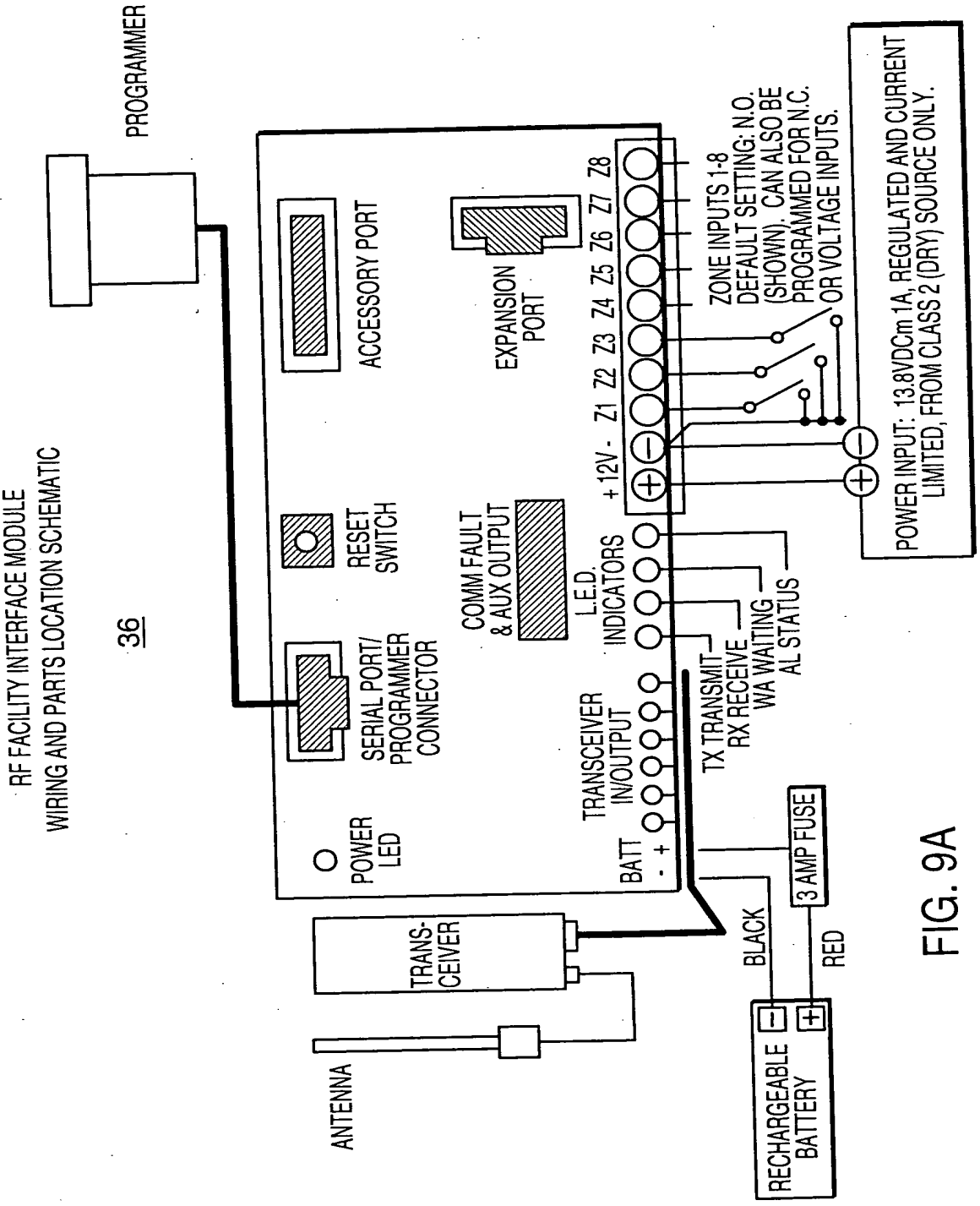

RF FACILITY INTERFACE MODULE
WIRING AND PARTS LOCATION SCHEMATIC
36
PROGRAMMER
ACCESSORY PORT
EXPANSION PORT
RESET SWITCH
SERIAL PORT/ PROGRAMMER CONNECTOR
COMM FAULT & AUX OUTPUT
L.E.D. INDICATORS
+12V - Z1 Z2 Z3 Z4 Z5 Z6 Z7 Z8
ZONE INPUTS 1-8 DEFAULT SETTING: N.O. (SHOWN). CAN ALSO BE PROGRAMMED FOR N.C. OR VOLTAGE INPUTS.
POWER INPUT: 13.8VDCm 1A, REGULATED AND CURRENT LIMITED, FROM CLASS 2 (DRY) SOURCE ONLY.
POWER LED
TRANSCEIVER IN/OUTPUT
BATT - +
TX TRANSMIT
RX RECEIVE
WA WAITING
AL STATUS
3 AMP FUSE
BLACK
RED
TRANS-CEIVER
ANTENNA
RECHARGEABLE BATTERY

FIG. 9A

ELECTRICAL RATING: 13.8VDC, 80ma STANDBY, 1000ma TRANSMIT
ONBOARD FUSE: SELF RESETTING
IN-LINE BATTERY FUSE: 3 AMPERE
RECHARGEABLE BATTERY REQ: 12V, 4 TO 7 AH
LOW BATTERY CONDITION IS REPORTED TO THE CENTRAL STATION.

STATUS INDICATORS

RX ,TX - INDICATE RADIO RECIEVE (RX) OR TRANSMIT (TX)
WA - STEADY ON = WAITING FOR ACKNOWLEDGEMENT OF LAST TRANSMISSION;
BLINKING = NOT ON NETWORK
STEADY OFF = NORMAL

AL - ALERT / TROUBLESHOOTING INDICATOR, "BLINK" CODES AS FOLLOWS:

-	STEADY BLINK - SYSTEM OK;
--	SHORT-SHORT BLINK - LOW BATTERY;
---	SHORT-LONG BLINK - AN INPUT ZONE IS IN ALARM;
----	SHORT-SHORT-LONG BLINK, LOW BATT AND ZONE IN ALARM;
STEADY	NO BLINK - SELFTEST FAILURE (OTHER THAN LOW BATT)

PWR - INDICATES UNIT HAS POWER

FIG. 9B

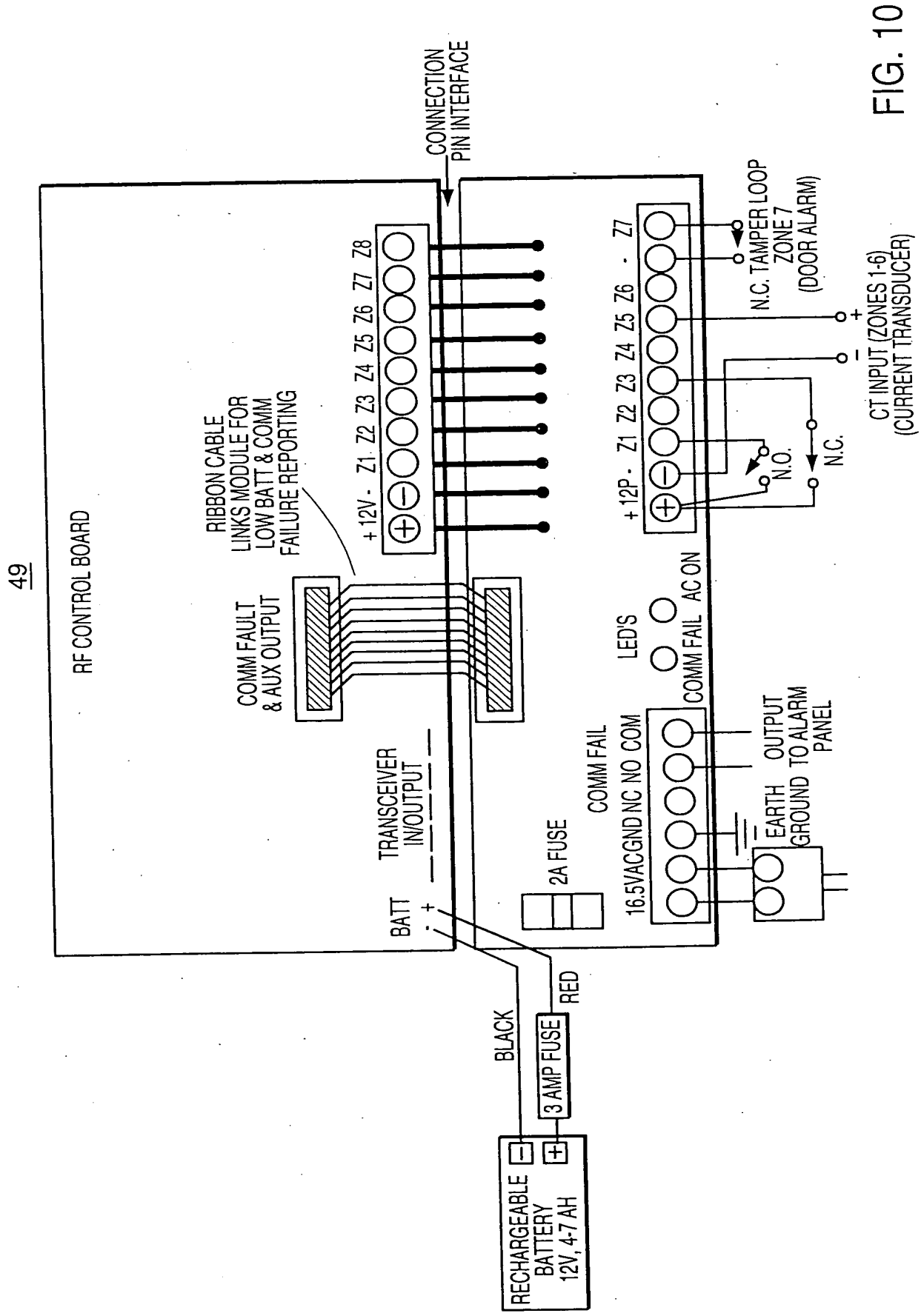
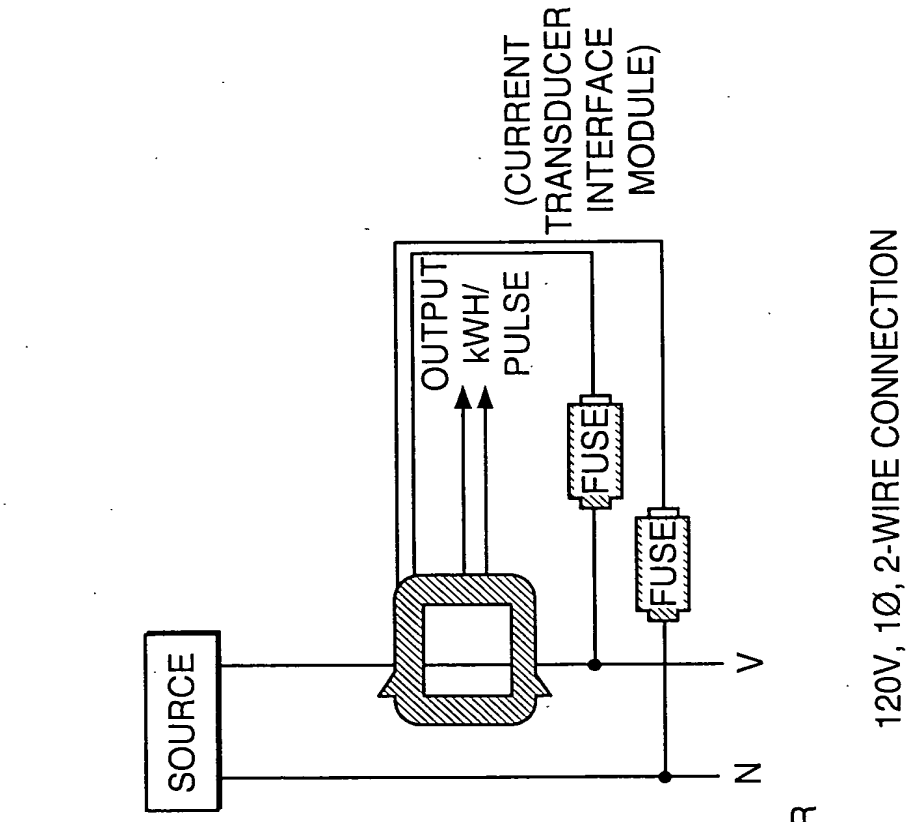
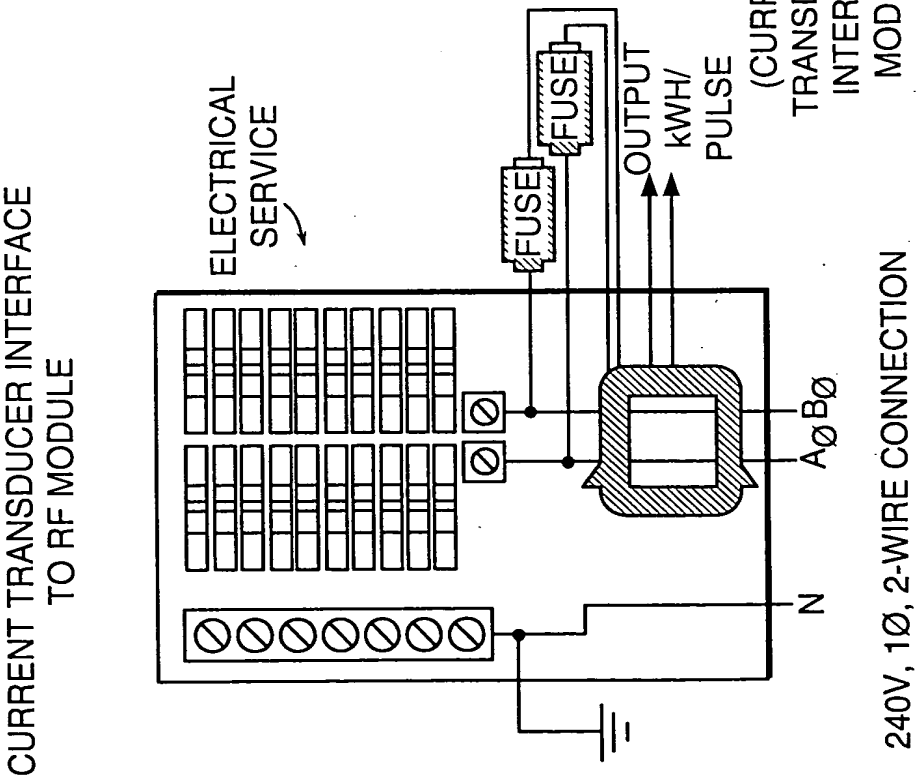

49
RF CONTROL BOARD
CONNECTION PIN INTERFACE
RIBBON CABLE LINKS MODULE FOR LOW BATT & COMM FAILURE REPORTING
+12V - Z1 Z2 Z3 Z4 Z5 Z6 Z7 Z8
+12P - Z1 Z2 Z3 Z4 Z5 Z6 - Z7
N.C. TAMPER LOOP ZONE 7 (DOOR ALARM)
CT INPUT (ZONES 1-6) (CURRENT TRANSDUCER)
N.O.
N.C.
COMM FAULT & AUX OUTPUT
LED'S
COMM FAIL AC ON
TRANSCEIVER IN/OUTPUT
BATT - +
2A FUSE
COMM FAIL
16.5VACGND NC NO COM
EARTH GROUND
OUTPUT TO ALARM PANEL
BLACK
RED
3 AMP FUSE
RECHARGEABLE BATTERY 12V, 4-7 AH

FIG. 10



120V, 1Ø, 2-WIRE CONNECTION

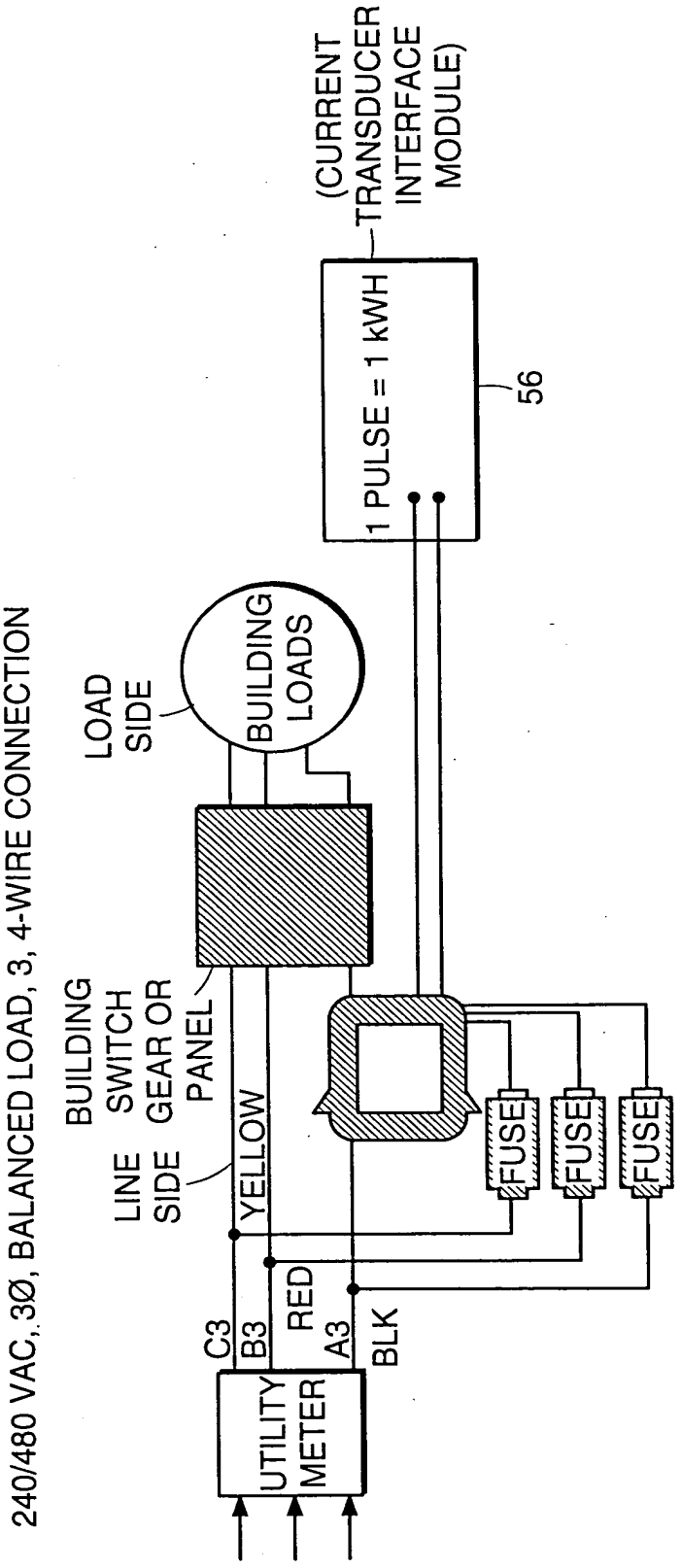
FIG. 11B



240V, 1Ø, 2-WIRE CONNECTION

FIG. 11A

CURRENT TRANSDUCER INTERFACE TO RF MODULE



SCHEMATICALLY DEMONSTRATE HOW ENERGY DATA OF DIFFERENT ELECTRICAL PHASE TYPES CAN BE INTEGRATED TO THE RF MODULE VIA A PULSE OUTPUT FROM CT TRANSDUCER.

FIG. 11C

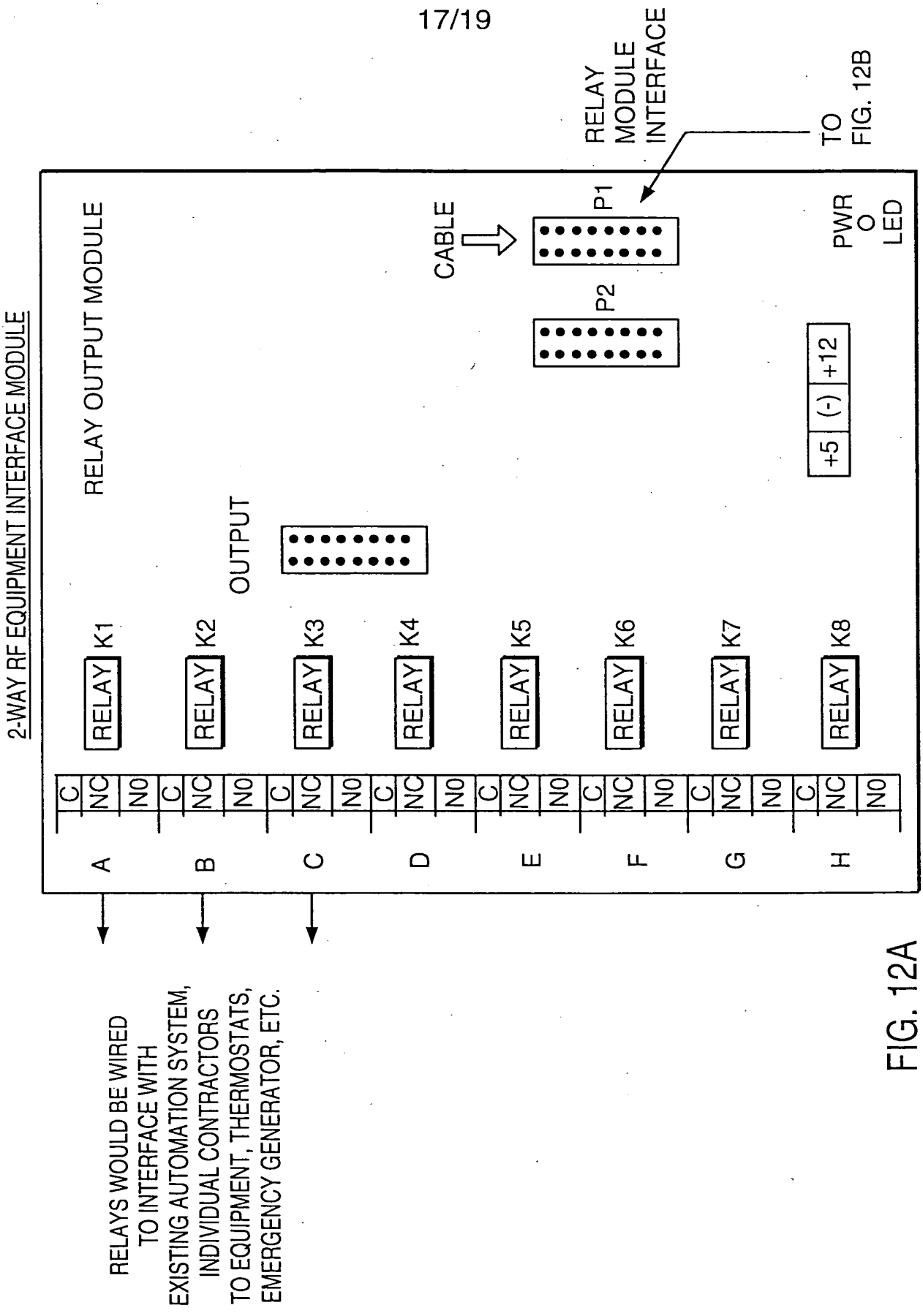

2-WAY RF EQUIPMENT INTERFACE MODULE
RELAY OUTPUT MODULE
OUTPUT
RELAY MODULE INTERFACE
TO FIG. 12B
CABLE
P1
P2
PWR LED
+5
(-)
+12
K1
K2
K3
K4
K5
K6
K7
K8
RELAY
C
NC
NO
A
B
C
D
E
F
G
H
RELAYS WOULD BE WIRED TO INTERFACE WITH EXISTING AUTOMATION SYSTEM, INDIVIDUAL CONTRACTORS TO EQUIPMENT, THERMOSTATS, EMERGENCY GENERATOR, ETC.

FIG. 12A

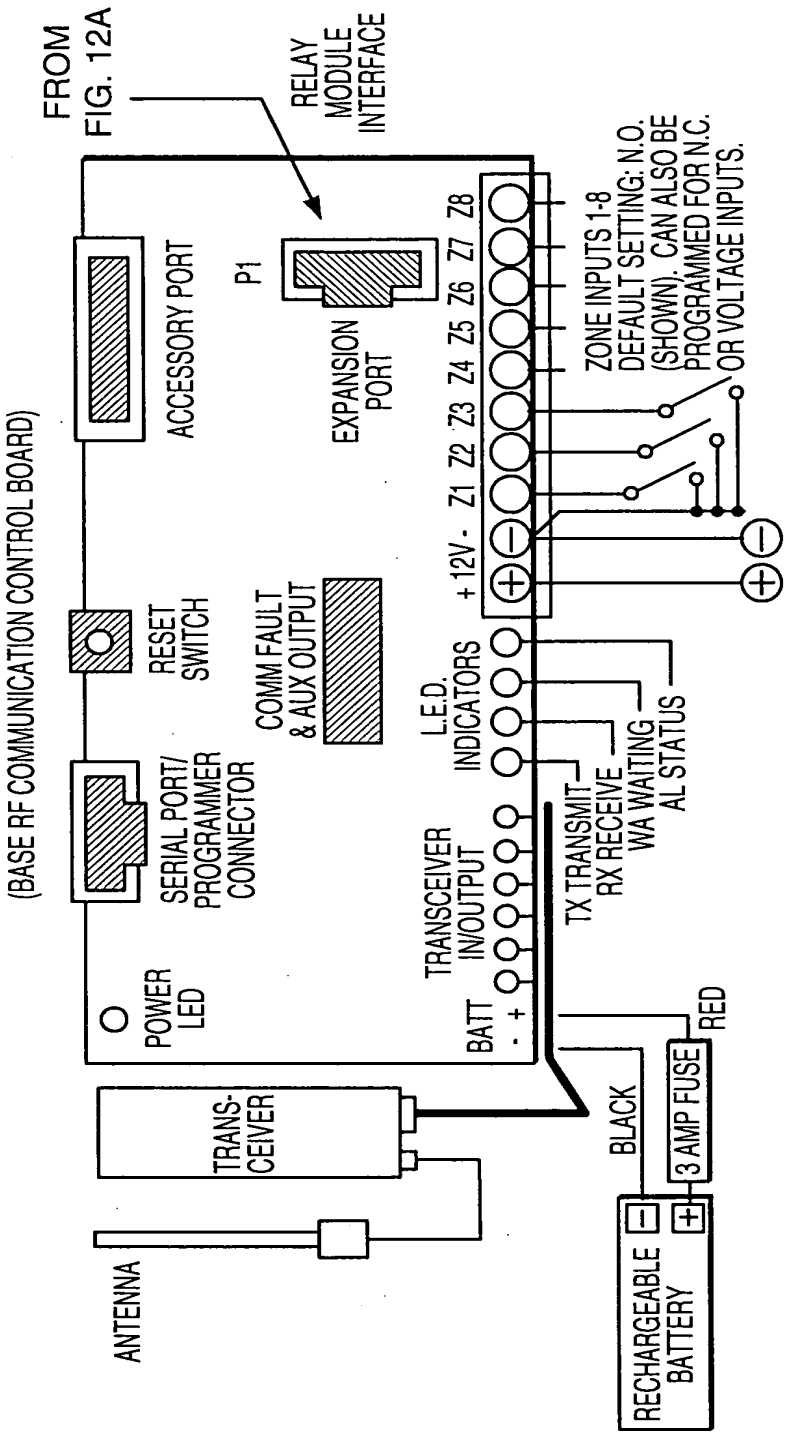
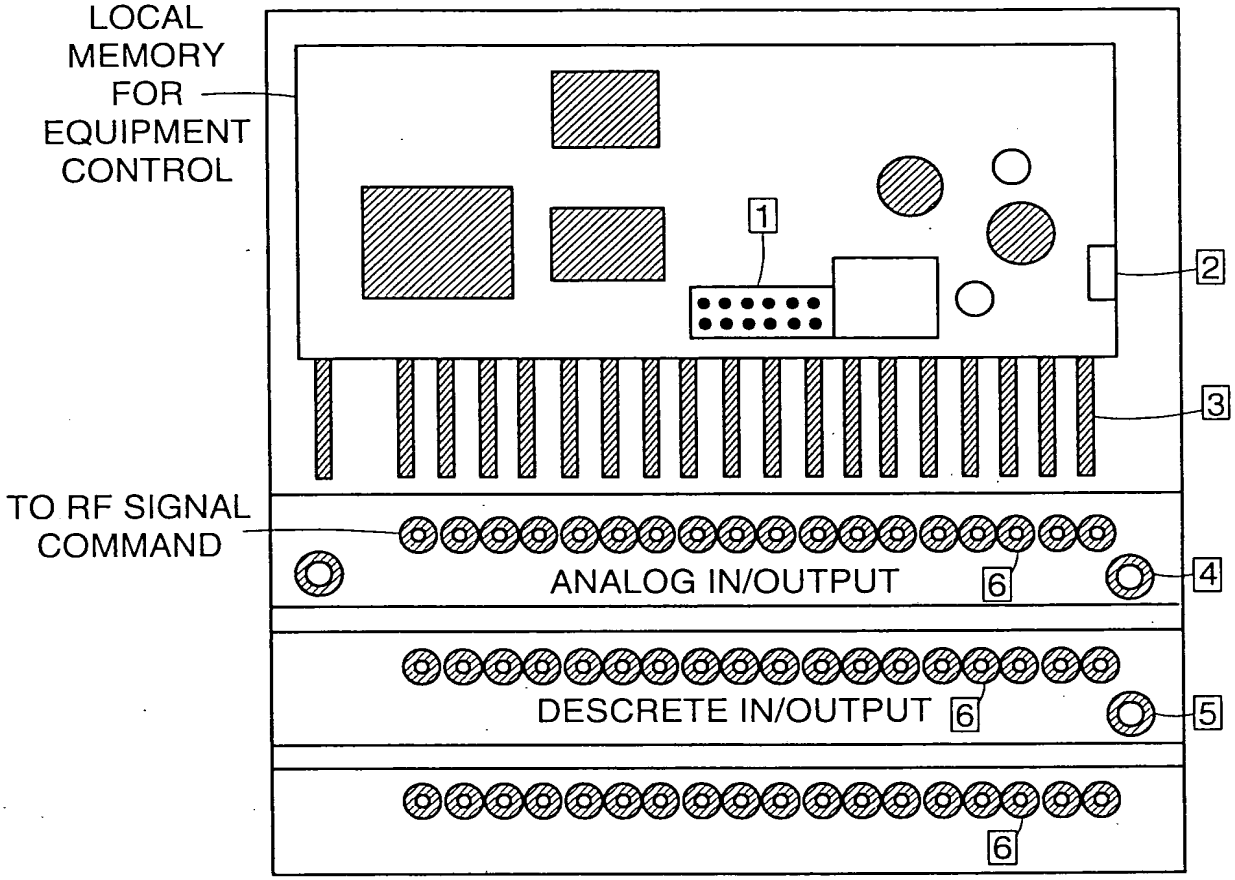

FROM FIG. 12A
RELAY MODULE INTERFACE
ACCESSORY PORT
P1
EXPANSION PORT
Z8 Z7 Z6 Z5 Z4 Z3 Z2 Z1 - +12V
ZONE INPUTS 1-8 DEFAULT SETTING: N.O. (SHOWN). CAN ALSO BE PROGRAMMED FOR N.C. OR VOLTAGE INPUTS.
(BASE RF COMMUNICATION CONTROL BOARD)
RESET SWITCH
COMM FAULT & AUX OUTPUT
L.E.D. INDICATORS
SERIAL PORT/ PROGRAMMER CONNECTOR
TRANSCEIVER IN/OUTPUT
TX TRANSMIT
RX RECEIVE
WA WAITING
AL STATUS
POWER LED
BATT - +
TRANS-CEIVER
BLACK
RED
3 AMP FUSE
ANTENNA
RECHARGEABLE BATTERY

FIG. 12B

RF INTERFACE TO LOCAL EQUIPMENT CONTROLLER



LABEL	DESCRIPTION
1	INTERNAL INTERFACE (ATI) CONNECTOR LOCAL LOGIC CONTROLLER
2	GROUND CONTACT FOR THE ADAPTER
3	LED STATUS DISPLAY
4	MOUNTING HOLES FOR PANEL MOUNT
5	GROUNDING SCREW
6	SOCKETS FOR THE TERMINAL CONNECTORS

FIG. 13